Professor: Bob McQuaid

Advanced Statistical Models for Business

Spring Trimester 2015 –Session B

DESC-620.16
Monday
8:00 am – 12:00 pm
Room P-2

DESC-620.11
Monday
1:00 pm – 5:00 pm
Room P-2

Malibu Campus

SYLLABUS
DESC-620: Advanced Statistical Models for Business
Summer 2015

Day and Class times: DESC620.16 Monday, 8:00 AM - 12:00 PM
Desc620.16 Monday, 1:00 PM - 5:00 PM
Location: Room P-2, Malibu Campus, Beckman Management Center

Professor: Bob McQuaid
Office: Westlake Village Graduate Center
Google Voice: 805-870-5709
E-mail: Bob.McQuaid@pepperdine.edu

Course Description

Recently, there has been a dramatic increase, among both business consultants and in-house corporate analysts, in the use of specialized statistical models for qualitative analysis, especially in the functional areas of decision analysis, finance and marketing research. This course begins with a relatively advanced treatment of model building for decision makers and continues with a comprehensive presentation of the use of JMP to analyze discrete multivariate models (i.e. models for purely categorical response variables). While some attention is given to long-standing techniques for categorical data, including chi-square tests and contingency table analysis, the primary focus of the course will be “modeling techniques”, particularly logistic regression, factor analysis, cluster analysis, and discriminant analysis.

Cases and practical illustrations used in the course will come from a variety of business disciplines, with particular emphasis on finance, market research, and healthcare management applications. Some compelling examples include:

- Credit (and default) prediction/scoring models.
- Analyzing focus group data.
- Customer Relationship Management models.
- Cash management (dividend-repurchase policy) models.
- Healthcare policy models.

Course Objectives

1. Challenge students to think analytically and critically about business problems having discrete outcomes – and to model those problems in a spreadsheet environment.
2. Encourage students to use an integrated approach when making decisions, calling upon their expertise in all other substantive business disciplines.
3. Provide students with an intuitive understanding of the essential theories and analytical tools (JMP) that can be used to accomplish the goals stated above.
Mission

This course explores the role of the values-centered leader in decision-making, and includes aspects of social, ethical and environmental stewardship in establishing the optimal decision policies for a firm. In addition, this course advances the Graziadio School’s mission of including applied research topics in the education of its graduate business students.

Textbook and Course Materials

There is no required textbook for this course. A variety of resources will be provided including those included with the software, websites with valuable information, and the software vendors resources. Although there is no textbook for the course, students are required to purchase JMP Analytical software, since the models developed in this course cannot be analyzed with the basic data analysis tools of Excel. It is an important objective of the course is to expose students to powerful tools, since many companies are using the software for business decision making (postings for analytical positions in business now often state that knowledge and experience with advanced analytical software are desired).

Purchase Software:

1. Go to http://www.onthehub.com/jmp
2. Select the button.
3. In the “Choose a platform” dropdown, select MAC or WINDOWS operating system.
4. Purchase a six- or twelve-month license by selecting the appropriate button.
5. Select the button.
6. Check the “I have an institution issued email address” and select CONTINUE.
7. Enter your Pepperdine email in the box and select continue.
8. Complete the form and select REGISTER.
9. Complete the purchase of the software and install it on your machine.
10. Once installed, run the program, select HELP, “About JMP...”, and the “check for updates” link. Install any updates recommended by the vendor.

The remaining steps are self-explanatory. Please install the software on your laptop by the start of the first class meeting. Make sure you complete through step 10 above before class begins.

Visit the JMP for Academic site and view the videos titled:
JMP for Students 1: Navigation and Use and select the “Watch Now” link. (32 minutes)
JMP for Students 2: Basic Statistics and select the “Watch Now” link (21 minutes)
Grading

<table>
<thead>
<tr>
<th>Weight</th>
<th>Max Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly Quizzes (5)</td>
<td>50%</td>
</tr>
<tr>
<td>Case Presentation (1)</td>
<td>10%</td>
</tr>
<tr>
<td>Final Exam – comprehensive (1)</td>
<td>35%</td>
</tr>
<tr>
<td>Administrative</td>
<td>5%</td>
</tr>
</tbody>
</table>

Each deliverable (quiz, presentation, and final exam) is graded on a 100 point scale and then weighted as shown. Your final course grade is assigned by applying the grading scale shown below to this weighted average score.

Grading Scale

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Letter Grade</th>
<th>Grade Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>94</td>
<td>100</td>
<td>A</td>
<td>4.0</td>
</tr>
<tr>
<td>91</td>
<td>93.99</td>
<td>A-</td>
<td>3.7</td>
</tr>
<tr>
<td>89</td>
<td>90.99</td>
<td>B+</td>
<td>3.3</td>
</tr>
<tr>
<td>84</td>
<td>88.99</td>
<td>B</td>
<td>3.0</td>
</tr>
<tr>
<td>81</td>
<td>83.99</td>
<td>B-</td>
<td>2.7</td>
</tr>
<tr>
<td>79</td>
<td>80.99</td>
<td>C+</td>
<td>2.3</td>
</tr>
<tr>
<td>74</td>
<td>78.99</td>
<td>C</td>
<td>2.0</td>
</tr>
<tr>
<td>71</td>
<td>73.99</td>
<td>C-</td>
<td>1.7</td>
</tr>
<tr>
<td>&lt;71</td>
<td></td>
<td>F</td>
<td></td>
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</tbody>
</table>

Administrative

This graded element relates to the extent to which you follow instructions and complete various functional aspects of the course as requested. Points will be deducted from this based on a failure on your part to address requested tasks in a timely manner. Examples of point deductions off the maximum possible score of 100 include:

- failing to have the JMP software operational on your laptop at the beginning of class in Week 1 (30 point deduction)
- failing to complete the course evaluation in class on Week 7 (30 point deduction)
- failing to submit a peer evaluation for your team case presentation (30 points)
- failing to submit assigned deliverables per the designed process (10 points per violation)
- failing to use the file name format requested for submitted deliverables (5 points per violation)
- failing to edit the SUBJECT line of an email to me to match what the content (2 points per violation)

There are other issues that could lead to deductions, but I typically caution an individual repeatedly before deducting points in other areas.
Weekly Quizzes

At the beginning of each class session (weeks 2-6), a 30-minute quiz will be administered. The quiz may contain multiple-choice questions, short answer problems, or working a problem and uploading files. Content will be drawn from the prior week’s material and assignments as well as any pre-work assigned for class that day. The quizzes are open book and notes, but the 30-minute limit will be strictly enforced, so do not plan to waste time searching for answers.

You must be in the classroom during your assigned section to participate in the quiz unless you have made other arrangements with me at least one business day prior to the quiz start time. The quiz must be submitted within 30-minutes of the scheduled start time for your assigned class section. To ensure you have the full allotted time, you should plan your travel and arrival so that you can start the quiz at the scheduled time. If you arrive late, you will not receive additional time to complete the quiz.

Missed quizzes

1. Given the variation in content and learning, individual scores vary on missed quizzes. Therefore, the rules below use standardized scores (Score_std) related to overall class scores on each quiz (mean and standard deviation).
2. You must submit a minimum of THREE quizzes. If you submit fewer than three quizzes, then you will receive a 0 for each missed quiz and items 3 and 4 regarding missing quizzes do not apply.
3. Scores recorded for each unplanned missing quiz are:
   a. First: Lowest Score_std of your remaining quizzes
   b. Second: 50% of Lowest Score_std of your remaining quizzes
4. Scores recorded for each School-sponsored extracurricular activity are:
   a. First: Higher of Score_std Average or Median of your remaining quizzes
   b. Second: Lower of Score_std Average or Median of your remaining quizzes
   c. To receive credit for a School-sponsored extracurricular activity, documentation must be provided in advance.

Case Presentation

During the last two class sessions, teams of four students each will present a case. Cases will require about 15 minutes to present and each student must present at least 3 minutes of “data driven” content. Teams presenting on Session 6 (April 6) will receive their case assignment on Session 4 (March 23) and teams presenting on Session 7 (April 13) will receive their case assignment on Session 5 (March 30). A grade rubric and expectations will be provided. Failure to attend class when your group is presenting will reduce your individual score for this assignment by 80% of the group score. A peer evaluation must be submitted by each student evaluating the contribution of other students on their team.
Final Examination

The final examination will be a 3-hour comprehensive examination and be completed during the final class session (April 13) immediately following the case presentations. The final examination will contain multiple-choice questions, short answer problems, and working a problem and uploading files. Content will be comprehensive covering material and assignments from week 1 through week 6. The examination is open book and notes. You must be in the classroom during your assigned section to participate in the examination unless you have made other arrangements with me at least one business day prior to the scheduled start time.

Course Schedule:

<table>
<thead>
<tr>
<th>Session</th>
<th>Topics</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td></td>
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<tr>
<td>2</td>
<td>Discriminant Analysis</td>
<td>Quiz 1</td>
</tr>
<tr>
<td>3</td>
<td>ANOVA / MANOVA / MANCOVA</td>
<td>Quiz 2</td>
</tr>
<tr>
<td>4</td>
<td>Logistic Regression</td>
<td>Quiz 3</td>
</tr>
<tr>
<td>5</td>
<td>Factor Analysis</td>
<td>Quiz 4</td>
</tr>
<tr>
<td>6</td>
<td>Cluster Analysis</td>
<td>Quiz 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Case Presentations</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Final Exam</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Case Presentations</td>
</tr>
</tbody>
</table>
Decision Sciences Departmental Policies:

1. Syllabus:
   a. Students are requested to familiarize themselves with the syllabus before the first class (document accessible via Sakai).
   b. Refer to the syllabus continually during the semester for recommended material for class preparation and for assignments.

2. Attendance
   a. Students should show up on time and stay for the entire class. If you must leave class early for some reason, please notify the professor about this before class or at the break. The same applies if you know you will be late for class – email the professor and/or classmate(s), as appropriate.
   b. Students should promptly return from breaks.
   c. If a student must miss a class, he/she needs to give as much advance notice as possible to the professor and have a proactive plan about making up the class material. Also he/she needs to notify group members and keep them informed. If the professor teaches another section, inquire about sitting in on another section.
   d. At the beginning of the semester, students should notify their work supervisor about scheduled exams. If work travel plans still conflict with an exam, it is the student’s responsibility to be proactive in making arrangements to schedule a make-ahead or make-up exam. If the professor teaches multiple sections of the course, it might be possible to take the exam in one of those sections, or take it on another day at the center.

3. Student Class behavior
   a. Turn off cell phones or to vibrate only; students should quietly leave the room if they have to take a phone call. Even in the hallway, cell phone conversations should be in a low tone and not obtrusive.
   b. Students should extend the kind of courtesy they wish to receive when they are presenting/discussing. Side conversations should be brief and not disruptive.
   c. Food rules differ by professor, so check what is allowed. At a minimum, food should be consumed quietly and you should not leave a mess.
   d. The use of laptops is usually encouraged during class, but should be for class work only and not for surfing the Internet, emailing class members, listening to music or watching videos during class.

4. Student Channels of Communication
   a. Questions about the center (room, copying facilities, etc.) should be directed to the front desk at your center, and if still a problem, to the Center Director.
   b. Questions about your program, future offerings, and so forth should be directed to your Program Director at your center.
   c. Concerns about the class and feedback, should first be directed to the professor. Students have a right to request of a professor clarification of grading. If classroom or grading concerns are still not resolved, please contact Dr. Mark Chun, Academic Chair Decision Sciences, mark.chun@pepperdine.edu with your concerns in writing. The process then moves up to the Associate Dean and finally the Dean of GSMB. Any attempt to bypass this chain of command will result in delays as the message will be sent back down to the appropriate level.
University Policies:

Conduct

The University expects from all of its students and employees the highest standard of moral and ethical behavior in harmony with its Christian philosophy and purposes. Engaging in or promoting conduct or lifestyles inconsistent with traditional Christian values is not acceptable.

The following regulations apply to any person, graduate or undergraduate, who is enrolled as a Pepperdine University student. These rules are not to be interpreted as all-inclusive as to situations in which discipline will be invoked. They are illustrative, and the University reserves the right to take disciplinary action in appropriate circumstances not set out in this catalog. It is understood that each student who enrolls at Pepperdine University will assume the responsibilities involved by adhering to the regulations of the University. Students are expected to respect order, morality, personal honor, and the rights and property of others at all times. Examples of improper conduct for which students are subject to discipline are as follows:

- Dishonesty in any form, including plagiarism, illegal copying of software, and knowingly furnishing false information to the University.
- Forgery, alteration, or misuse of University documents, records, or identification.
- Failure to comply with written or verbal directives of duly authorized University officials who are acting in the performance of assigned duties.
- Interference with the academic or administrative process of the University or any of the approved activities.
- Otherwise unprotected behavior that disrupts the classroom environment.
- Theft or damage to property.
- Violation of civil or criminal codes of local, state, or federal governments.
- Unauthorized use of or entry into University facilities.
- Violation of any stated policies or regulations governing student relationships to the University.

Disciplinary action may involve, but is not limited to, one or a combination of the alternatives listed below:

- Dismissal – separation of the student from the University on a permanent basis.
- Suspension – separation of the student from the University for a specified length of time.
- Probation – status of the student indicating that the relationship with the University is tenuous and that the student’s records will be reviewed periodically to determine suitability to remain enrolled. Specific limitations to and restrictions of the student’s privileges may accompany probation.

Policy on Disabilities: Assistance for Students with Disabilities

The Disability Services Office (DSO) offers a variety of services and accommodations to students with disabilities based on appropriate documentation, nature of disability, and academic need. In order to initiate services, students should meet with the Director of the DSO at the beginning of the semester to discuss reasonable accommodation. If a student does not request accommodation or provide documentation, the faculty member is under no obligation to provide accommodations. You may contact the Director of Disability Services at (310) 506-6500. For further information, visit the DSO Web site at: http://www.pepperdine.edu/disabilityservices/